

Drinking Water Case History: THM Prevention & DOC Removal



Background

Cuf was sole sourced for a drinking water facility as it had unmatched purification performance and was the only viable solution for the trend of stricter regulations for reductions in color, THMs, and liquid waste. **Cuf** achieves all of these water purification requirements and provides an essentially Zero Liquid Discharge solution.

A 1 MGD well has been brought online at this site in order to reduce the demand on its existing potable well which is declining in capacity. The new well has high THM & HAA formation potential due to its DOC levels and has an amber color (150 cu). Operationally this new well is blended with the existing well which contains 1,000 ppb iron and 480 ppm TDS. The DOC, color and iron all need to be purified (removed) from the source water.

Solution

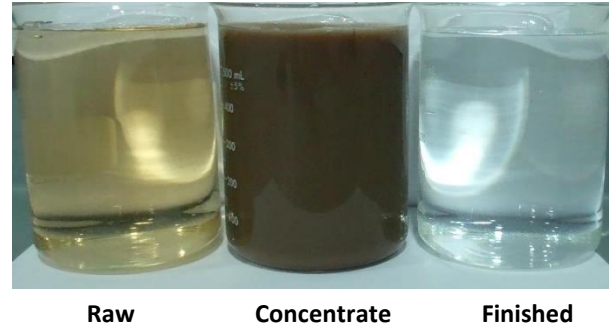
The 1 MGD **Cuf** system shown below has been installed and set to work. The two ground waters are gravity fed to the **Cuf** system, with the blend ratio and flow rate controlled over the full range to resolve TDS issues. A small amount of common coagulant is dosed at the inlet of the **Cuf** for DOC coagulation. The DOC coagulation and iron oxidation occurs rapidly in the **Cuf** and is filtered and concentrated in real time. The need and cost of large coagulation basins, mixers, clarifiers and the EDR are eliminated.



The palletized **Cuf** above is the entire water plant and operates on demand removing Color, Fe and the majority of DOC which significantly reduces chlorine demand. Accordingly, once the **Cuf** system was brought on-line chlorine addition was reduced by 75%. Reduction in DOC and chlorine residual solves THM & HAA formation problems. Purified water is discharged directly to the clear well.

Performance

Parameters	Inlet	Outlet
Blend Ratio	50/50	Clear Well
Color	85 CU	5 CU
DOC	3.3 ppm	< 1.0 ppm
Iron	400 ppb	< 10 ppb
Flux	480 GFD	5 psi TMP
Energy		0.3 kWh/m ³
THMs	N/A	38 ppb
HAAs	N/A	18 ppb
Coagulant	14 ppm	Non-detect
TMP Maintenance	Monthly	



Zero Liquid Discharge (ZLD)

Concentrated DOC and Iron is filtered by **Cuf** and further dewatered by the integration of the DeWatering Recovery System (DeWRS). The integrated process eliminates liquid waste, creating zero liquid discharge that results in a wet sludge which can be sent to a digester or landfill. The process produces approximately 50 gal/day of >20% solids.



Recovered DOC & Fe



Reference Documents

- DOC3019 **Cuf** Ceramic Ultra Filtration
- DOC2015 Technical Briefing: THM (& HAA) Prevention & Color Removal
- DOC2029 On-Site Pilot Testing
- DOC4030 **DeWRS** Case History: Drinking Water with Zero Liquid Discharge

Facility Tours

Tours of this Vicksburg, MS facility are offered every Thursday from 10:00AM – 12:00PM. Contact Purifics at least one week in advance to arrange a site tour.



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